IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of
Hiroshi OGAWA — Attorney Docket No. 1982-0149P
Application. No.: 09/560,819
Confirmation No.: 5103 — Group Art Unit: 2879
Filed: April 28, 2000 — Examiner: Sikha Roy
For: RADIATION IMAGE CONVERSION PANEL

DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
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Sir:

I, Hiroshi OGAWA, hereby declare and state that:

I am a citizen of Japan;

I was conferred a Bachelor of Science degree from Chiba University, Faculty of Engineering, Department of Synthetic Chemistry in March, 1972;

I joined Fuji Photo Film Co., Ltd., in April, 1972, and since then I have been working in the company and was involved in development of magnetic tapes to December 1995. I was involved in improvement of magnetic recording layer of Advanced Photo System film from December 1995 to April 1998. Further, I was involved in development of Imaging Plates from April 1998 to May 2002. I am a part of the technical staff for producing Image Plates since May 2002;

I am an inventor of the invention described and claimed in the above-identified application;

I am familiar with the prosecution of the above-identified application; and

the experimentation set forth below was conducted by me or under my direct supervision.

EXPERIMENTATION

Three radiation image conversion panels are prepared by using a similar method as described in Example 1 of the present specification.
For preparing an upper-layer phosphor sheet, phosphor used has a grain size of 8 μ m, and 60 parts of a binder is used.
For preparing a lower-layer phosphor sheet, phosphor used has a grain size of 80 μ m, and 50 parts of binder is used.
A reflective layer, a lower-layer sheet and an upper layer sheet are dried separately, and are subjected to thermo-compression bonding, the resultant being a bonded sheet. The thermo-compression bonding is conducted by using a calendar roll. The protective layer of Example 1 is applied on the bonded sheet, and the edge covering liquid of Example 1 is applied on the bonded sheet and dried to obtain a radiation image conversion panel.
Thickness of an upper-layer sheet and that of a lower-layer sheet is listed in the following table. Thickness of a reflective layer is 20 μ m.

Three radiation image conversion panels for comparative examples are prepared by using the same materials as described above but by using a different process.
A bonded sheet is prepared by coating and drying a lower-layer sheet solution on a reflective layer, and then coating and drying an upper-layer solution on the lower-layer sheet, step by step. The protective layer of Example 1 is applied on the bonded sheet, and the edge covering liquid of Example 1 is applied on the bonded sheet and dried to obtain a radiation image conversion panel.
Thickness of an upper-layer sheet and that of a lower-layer sheet is listed in the following table. Thickness of a reflective layer is 20 μ m.

The image qualities of images obtained from the radiation image conversion panels of examples and comparative examples are

evaluated by using the methods described in Example of the present specification. And sharpness is measured by modulation transfer function (MTF) (Space frequency: 2 cycle/mm) of an image obtained.

The measurement of MTF is carried out as follows. An aluminum filter having a thickness of 21mm is placed directly below the molybdenum tube. A tungsten piece of 10 cm square (thickness of 1mm, the four edges thereof having been cut such that the angle is close to 90° as much as possible) is prepared. X ray irradiation is carried out while the tungsten piece is attached firmly to the surface of the radiation image conversion panel. At the time of photography, the tungsten piece is placed so as to be inclined at a 2° angle with respect to the edges of the panel. The irradiation conditions are 3mR, 70kVp, 20mA, and 630m sec. Then, the panel is scanned to obtain a digital X ray image. The edges of the tungsten piece are detected from the image. ESF (Edge Spread Function) is obtained from the density distribution of the edges, and the ESF is differentiated to obtain LSF (Line Spread Function). By Fourier transformation of the LSF, an MTF at 2cycle/mm is obtained. The objective MTF is obtained as an average of the data of four edges.

The results are shown in the following table.

Thickness (μ m)		Light emission quantity (%)		Graininess noise (x 10^{-2})		Sharpness	
Upper-layer phosphor sheet	Lower-layer phosphor sheet	Example	Comp. example	Example	Comp. example	Example	Comp. example
180	100	100	93	0.26	0.32	0.36	0.33
140	140	100	94	0.27	0.30	0.36	0.34
100	180	102	96	0.28	0.29	0.37	0.35

As can be seen from the data in the above table, it is apparent that

the present invention provides radiation image conversion panels with higher light emission quantity, lower graininess noise and higher sharpness.

Thus, I conclude that the present invention provides unexpectedly superior results.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 18. May. 2006

Hiroshi Ogawa

Hiroshi OGAWA